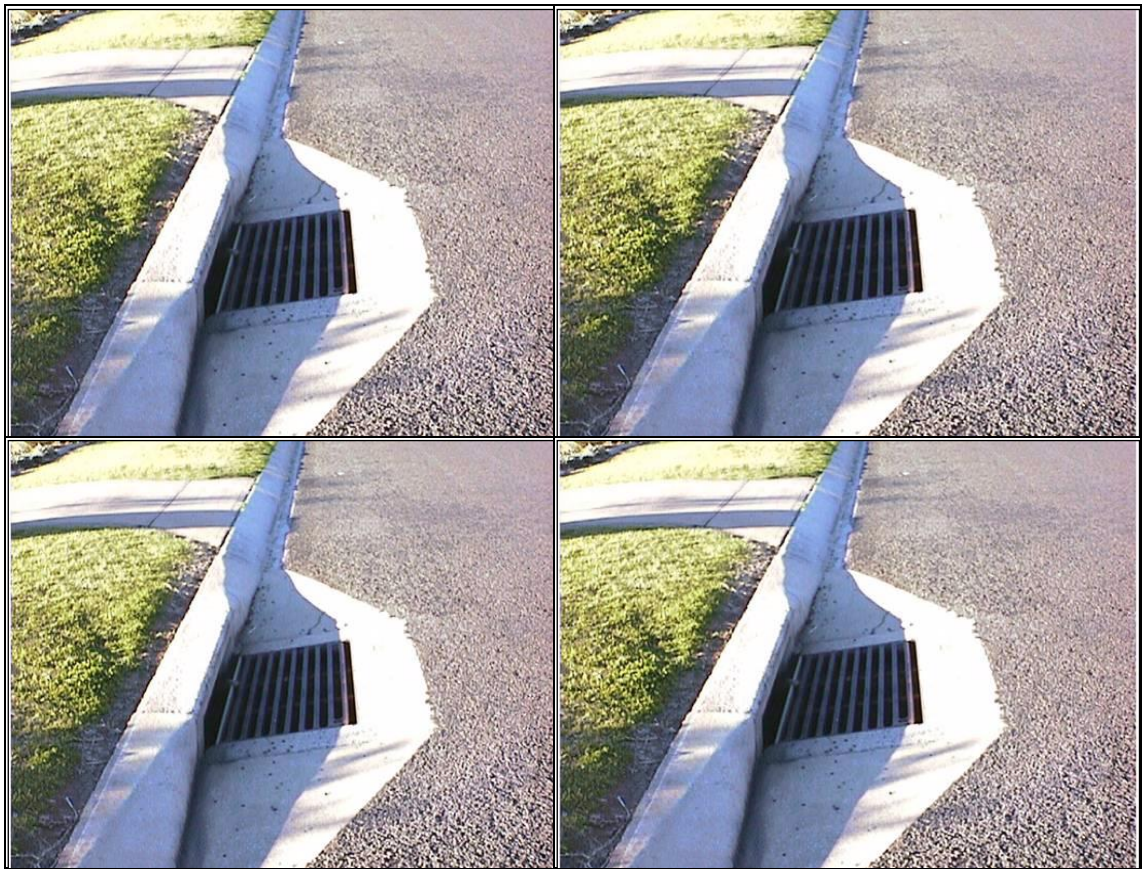
City of Wanneroo

Stormwater

Asset Management Plan



July 2021

1 EXECUTIVE SUMMARY

1.1 Current Services and Costs

The City of Wanneroo provides stormwater drainage infrastructure to safely and efficiently convey stormwater. The stormwater network includes the following assets:

- Drainage Pipes,
- Drainage Pits,
- Underground Infiltration Cells,
- Gross Pollutant Traps,
- Sumps

The categories, quantity and replacement cost of drainage assets are summarised in Table 1:

Table 1 - Current Stormwater Asset Portfolio (depreciable assets)

Stormwater Summary (as at 30/06/2020)				
Asset Category	**Unit**	**Quantity**	**% of total**	**Replacement Value ($)**
Drainage Pipes	m	39,892	50.55%	$228,608,395
Drainage Pits	units	40,499	21.93%	$99,153,453
Underground Cells	units	102	0.03%	$139,325
Gross Pollutant Traps	units	191	2.75%	$12,428,238
Sumps	units	392	24.74%	$111,884,476
Total			**100%**	**$452,213,887**

As at 30/06/2020, the City's Stormwater network has depreciable asset components with a current replacement value of approximately **$452** million.

The City's current 2020/21 budget allocation for stormwater is **$0.3M** for maintenance upgrades. There is no current budget for the renewal of the storm water due to the young nature of the assets.

1.2 Future Challenges

The stormwater network is currently in generally good condition and works associated with this asset group mainly relate to its maintenance over its life cycle and replaced at the appropriate intervention point.

The City plans to operate and maintain the stormwater network to achieve the following strategic objectives:-

1. Ensure that the stormwater network is maintained to a safe and functional standard as set out in this asset management plan including funding the required renewal demand to meet the expected intervention level.
2. Ensure that stormwater is constructed, upgraded and maintained in accordance with the City's standards.
3. Ensure that the stormwater service incorporates effective and efficient preventative and planned maintenance practices.

1.3 Recommendations

The following key tasks are recommended to improve the City's stormwater assets:

- Investigate future iterations of this Stormwater Asset Management Plan (SWAMP) to combine the TIAMP and SWAMP to a single comprehensive AMP.
- Implementation of Assetic (AMIS) to enable asset data to be stored in a corporate system.
- Introduce asset collection utilising the D-Spec format for capital works projects.
- Define and formalise intervention levels for maintenance activities on stormwater assets through a Maintenance Management Plan, possibly combined with transport.

These are further expanded on in Section 9 Improvement Actions.

2 INTRODUCTION

2.1 Background

Council provides services to the community and the majority of these services are provided through infrastructure assets. This Asset Management Plan (AMP) demonstrates responsive management of assets (and services provided from assets), compliance with regulatory requirements, and communicates the funding needed to provide the required levels-of-service over a 20 year planning period.

The City's Asset Management Policy requires the creation of AMPs for the different asset classes and this Stormwater Drainage Asset Management Plan has been developed for stormwater assets.

AMPs are developed for each asset class for the following purposes:

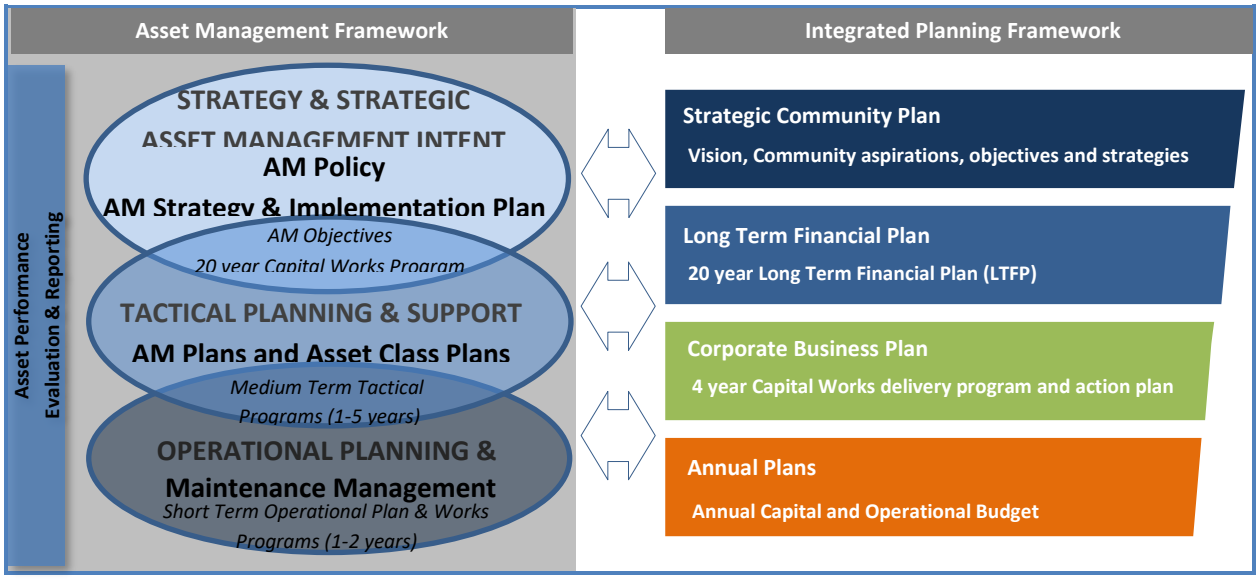
- Providing an appropriate level of service at a cost that is affordable to the community,
- Sustainable management of assets for the community,
- Providing input into the Long Term Financial Plan (LTFP),
- Document existing practices and identify opportunities for improvement,
- Meet legislative and reporting requirements,
- Support business cases and funding applications, and
  Support community and organisational needs.

This document is to be read in conjunction with the following City documents:

• Asset Management Policy (AS01-06/18)

• Asset Management Strategy 2018 – 2024

Asset Management Implementation Plan 2018 – 2024



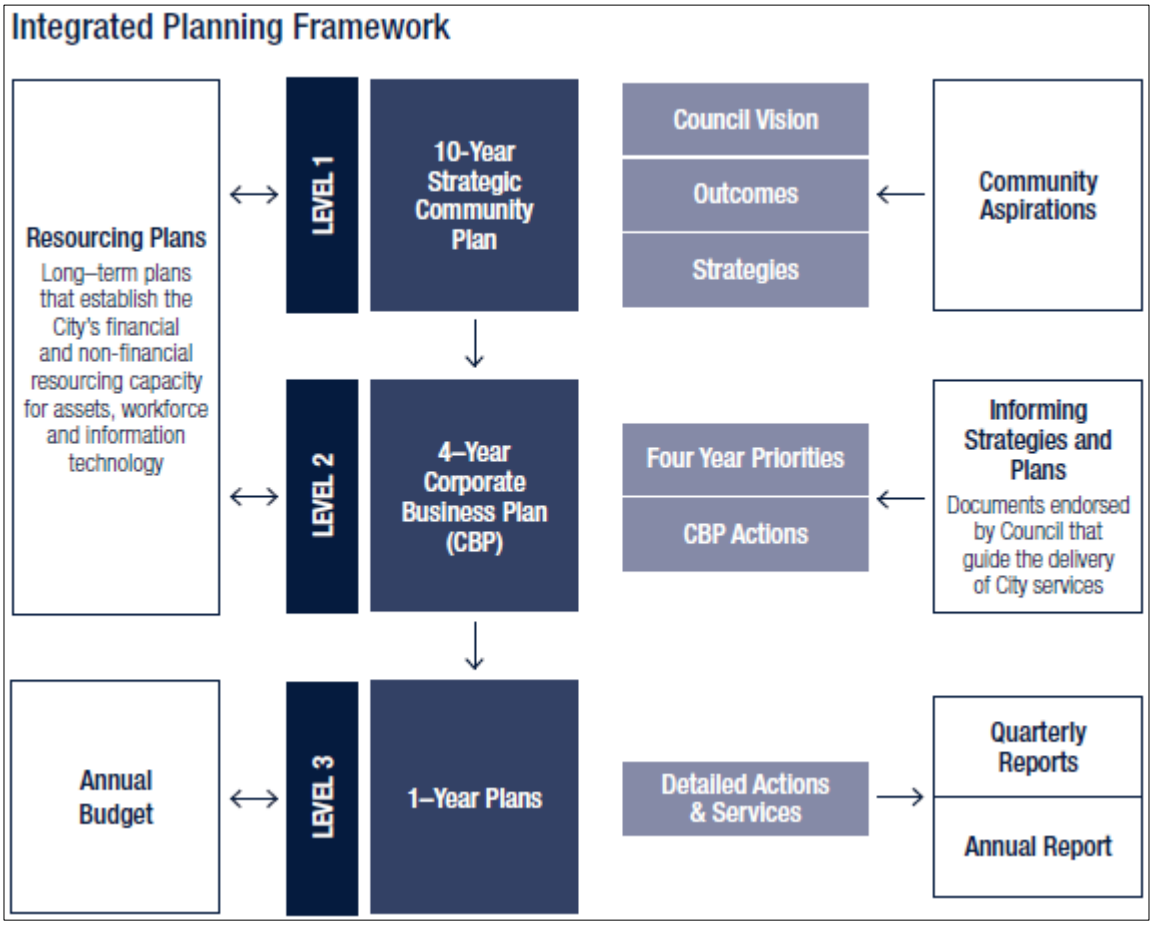
2.2 Alignment to Strategic Planning

This asset management plan is aligned with the following objectives and strategies (refer to Figure 1) from the City's Strategic Community Plan 2017/18 – 2026/27:

- Outcome 1.1 – Healthy and Active People
    - Strategy 1.1.1 Create opportunities that encourage people to be active and healthy lifestyles.
- Outcome 4.2 – Good Governance
    - Strategy 4.2.3 Ensure return on investment and well maintained assets through development and implementation of a strategic asset management framework

The City's aspirations as they relate to the Strategic Community Plan and this AMP are outlined in Appendix A.

Figure 1: Integrated Planning Framework



2.3 Asset Management Plan Framework

Key elements of this plan are

- **Levels of service** (Section 4) – specifies the services and levels of service to be provided by the City.
- **Life cycle management** (Section 5) – how the City will manage its existing and future assets to provide the required services.
- **Risk management** (Section 6) – how the City manages the risks associated with stormwater assets.
- **Future demand** (Section 7) – how this will impact on future service delivery and how this is to be met.
- **Financial summary** (Section 8) – what funds are required to provide the required services.
- **Improvements, Monitoring and Review** (Section 9) – how the plan will be monitored to ensure it is meeting the City's objectives and identify improvement opportunities in asset management practises within the organisation.

2.4 Scope

The stormwater asset types and components considered in this AMP are listed below:

- Drainage Pipes
- Drainage Pits: Junction Pits, Side Entry Pits, Gullys, and Bubble Up Pits
- Underground Cells
- Gross Pollutant Traps
- Sumps

It is noted that this AMP considers only depreciable assets and assets that have a finite life and incurs ongoing maintenance costs. Sump Formation cost, for example, is only incurred at the initial construction and is not expected to deteriorate and does not require renewal.

2.5 Data Systems and Data Confidence

The expenditure and valuations projections in this AMP are based on best available data. Currency and accuracy of data is critical to effective asset and financial management planning. Data confidence is classified on a 5 level scale rating (Ref IPWEA IIMM 2015 – Table 2.4.6 P2 | 71). The estimated confidence level for data and reliability of data used in this AMP is shown in Table 2.

Table 2: Data Confidence Assessment for Data used in AM Plan

Data	Confidence Assessment	Comment
Demand Drivers	Highly reliable	Based on Australian Bureau of Statistics data
Growth projections	Highly reliable	Based on Australian Bureau of Statistics data
Population Age	Highly reliable	Based on Australian Bureau of Statistics data
Condition ratings	Reliable	Based on age
Asset data	Reliable	Import of data to AMIS has shown that there are some gaps in data and that data validation needs to occur. Refer Improvement action #2, Section 9
Asset residual values	Reliable	Estimated using straight line depreciation. Reliant on useful life asset data.

Asset data is collected via D-SPEC for new assets acquired through Land Development. Currently, this is not occurring for assets acquired through capital works. It is suggested that the City collects capital works data through D-SPEC also. Refer improvement action #3, Section 9.

The City is currently implementing an Asset Management Information System (AMIS) – Assetic. Refer improvement action #1, Section 9. Until such time as this is implemented, the City currently utilises the following computer systems to manage its asset data:

- **RAMM (Road Assessment and Maintenance Management) – used for stormwater drainage pipes, pits, underground cells, gross pollutant traps, and sump fencing.**

  A database which stores the stormwater inventory and condition data. RAMM has the capability to analyse stormwater condition data and model future capital renewal requirements and propose works programs.

- **MapInfo – used for stormwater pipes, pits, underground cells, gross pollutant traps, and sump fencing.**

  A Geographical Information Systems (GIS) mapping software that is configured to enable the recording of the geographical location of the asset and also stores the attribute of the assets in tables. We are more confident with the MapInfo data and this is what is being used to transfer to Assetic (the new AMIS).

- **Asset Renewal Funding Demand Modelling Tool – used for all asset classes**

  This computing tool (developed in-house over several years) consists of a series of MS Excel spreadsheets that analyse asset data and uses simple built-in computations to model and

predict the future deterioration of assets. The outputs of this tool provide a prediction for future asset renewal funding demand and budgetary requirements.

This Renewal Modelling tool is loaded with the City's infrastructure asset inventory data together with assumptions and critical modelling parameters with the final computation and resultant output being used to inform the LTFP. The long term asset renewal demand predictions can be applied to all asset classes enabling comparisons to be made and also provides an overall view of all the City's asset classes for informed decision making.

The City is currently implementing an Enterprise Software Renewal Program (ESRP) which will include the acquisition of an Asset Management Information System (AMIS). It is intended that the City's assets data inventory will be migrated to the AMIS which will be linked with to the Finance Management Information System expenditure data and continue to be linked spatially in a GIS system.

2.6 Key Stakeholders

Table 3 below shows the key stakeholders in the preparation and implementation of this asset class plan:

Table 3 – Stakeholders

Stakeholders	Description and Level of Involvement
Ratepayer Groups and residents	Stakeholder consultation
Elected members	Stewardship and Asset Management Leadership. Endorsement of Asset Management Policy, AM Strategy, AM Plan. Adoption of the key AM principles and the approval of Capital Works Budgets that support good Asset Management principles.
Executive Leadership Team (ELT)	Provide strategic direction and leadership for asset management practices and decisions within the City. Responsible for the development of AM Policy, AM Strategy and AM Plans.
Assets Maintenance	Maintain the stormwater drainage network to a safe standard including the determination of technical levels of service, monitoring performance measures and condition assessments.
Infrastructure Capital Works	Design and construct stormwater assets to required standards.
Strategic Asset Management Service Unit	Long term planning and management of stormwater drainage assets inventory, renewal demand modelling and long term renewal budget analysis. Author and review of this AMP.
Corporate Strategy and Performance Directorate	Long Term Strategic and Financial Planning incorporating Asset Management principles. Financial reporting of asset performance. Capital Works Program development and scheduling for stormwater projects.

Stakeholders	Description and Level of Involvement
Planning and Sustainability Directorate	Plan for efficient stormwater networks. Improve stormwater drainage options and connections in future land subdivision developments. Review and approve engineering drawings and acceptance of stormwater drainage assets constructed as part of subdivisional developments.
Community and Place Directorate	Provision of adequate stormwater at various City facilities (i.e. community centres, libraries and sports facilities; aquatic centres, waste and recycling facilities).

2.7 Recommendations

The following improvements actions are recommended and further detailed in Section 9:

- Implementation of Assetic (AMIS) to enable asset data to be stored in a corporate system. Refer Improvement action #1
- Import of data to AMIS has shown that there are some gaps in data and that data validation needs to occur. Refer Improvement action #2
- The City will commence collecting capital works data through D-SPEC. Refer Improvement action #3

3 CURRENT STATUS OF ASSETS

The core asset data shown in this plan provides the baseline for growth and asset renewal demand predictions to be generated and is used to inform the City's annual budget and LTFP development. This data is stored in HPE 21/292616. Until such time that a major review of this plan is undertaken, this core data and asset performance predictions are updated annually as a new version of HPE 21/292616 to inform and update subsequent capital budgets and the LTFP.

The quantity and replacement value of stormwater infrastructure (as at 30 June 2020) considered in this AMP are summarised in table 4 below:

Table 4: Current Stormwater Assets

Stormwater Summary (as at 30/06/2020)				
Asset Category	**Unit**	**Quantity**	**% of total**	**Replacement Value ($)**
Drainage Pipes	m	39892	50.55%	$228,608,395
Drainage Pits	units	40,499	21.93%	$99,153,453
Underground Cells	units	102	0.03%	$139,325
Gross Pollutant Traps	units	191	2.75%	$12,428,238
Sumps	units	392	24.74	$111,884,476
Total			**100%**	**$452,213,887**

Values taken from Talis June 2020 Valuation HPE 20/364050

The unit rates of stormwater assets (as at 30 June 2020) considered in this AMP are summarised in Appendix B.

3.1 Age Profile

The age profile (represented by the total value of assets at the year of construction) of the City's stormwater assets are shown below.

Figure 2: Age profile of Stormwater Pipes

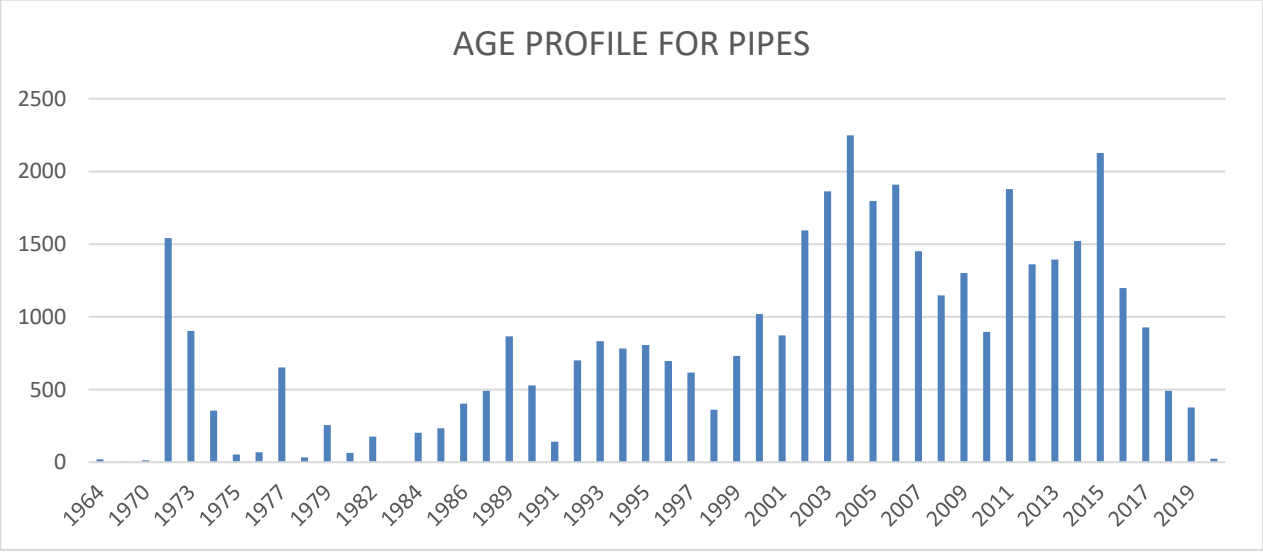


Figure 3: Age profile of Stormwater Pits

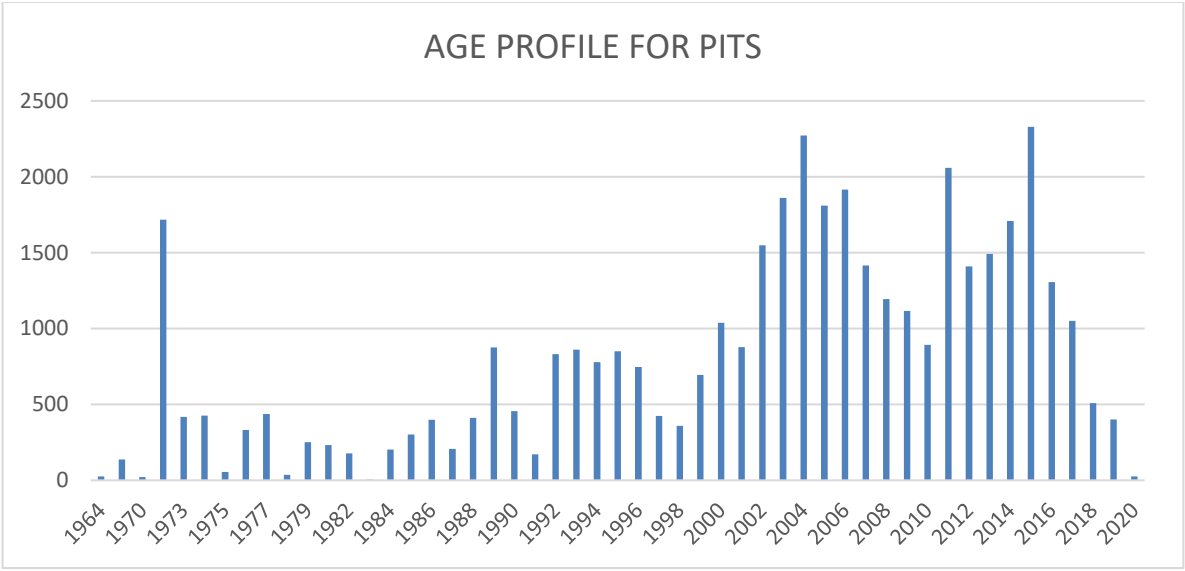


Figure 4: Age profile of Stormwater Underground Infiltration Cells

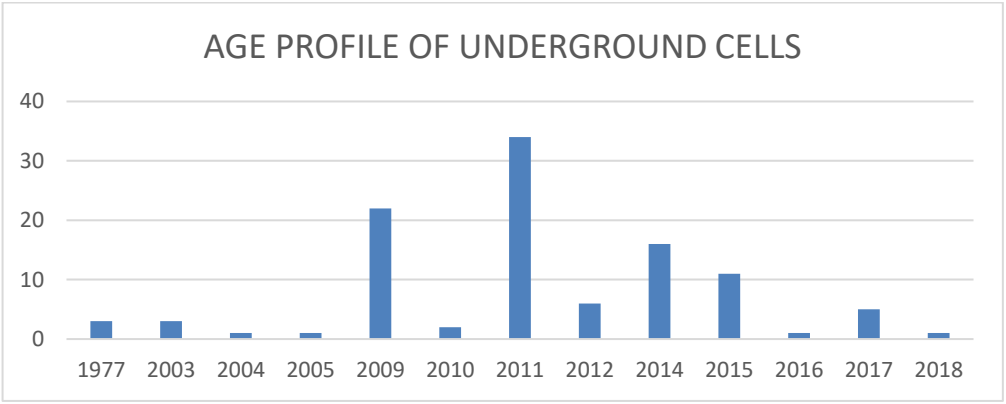


Figure 5: Age profile of Stormwater Gross Pollutant Traps

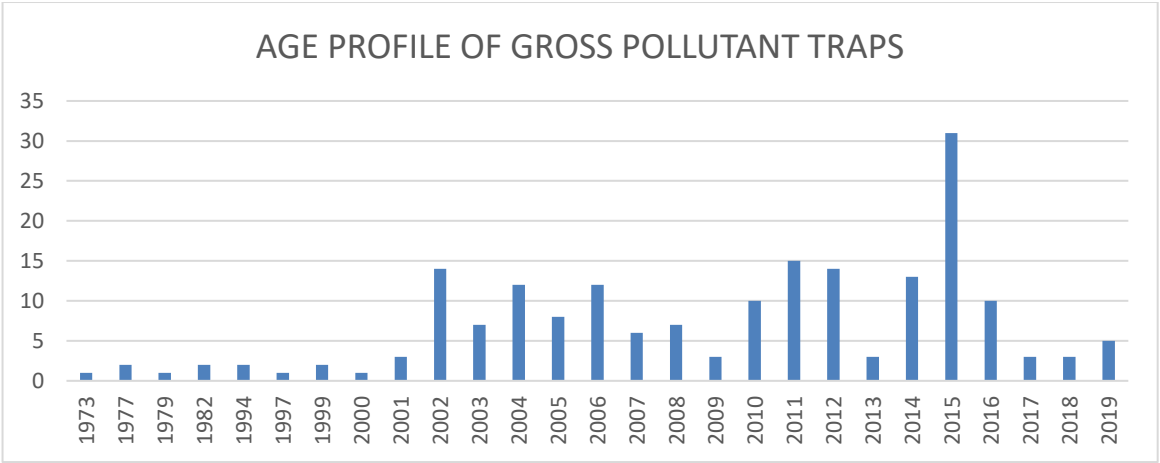
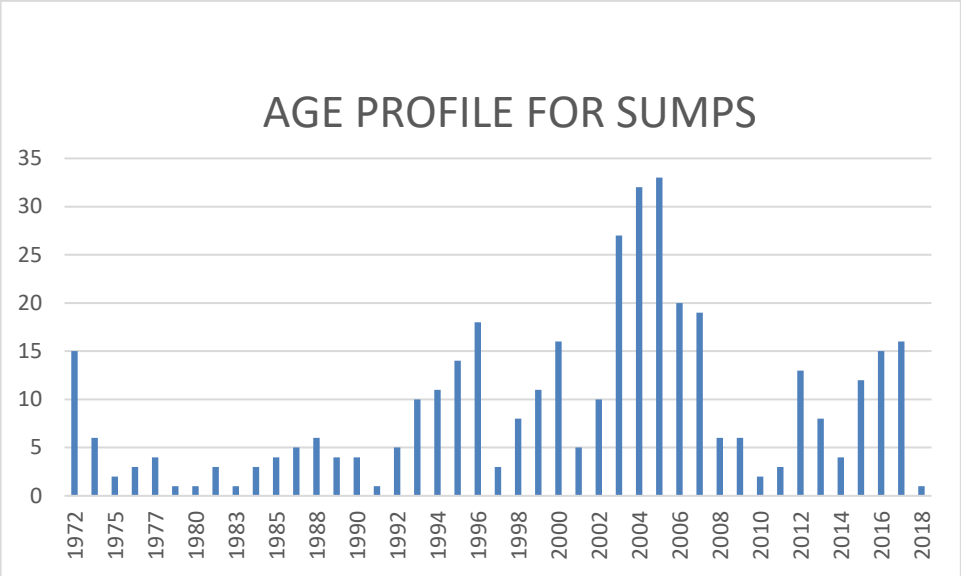


Figure 6: Age profile of Stormwater Sumps



The asset age profiles depicted above provide an indication of the growth experienced within the City of Wanneroo with relatively high rates of stormwater assets being constructed since the late 1990s.

3.2 Condition Profile

The City conditions its stormwater according to its age. The economic life in years of the asset is established and the condition is rated from 0 to 10 with the rating of 0 being new to 5 years old, 1 being 6 to 15 years old etc. Therefore the age graphs above also represents condition.

The average condition rating for each asset type is shown in the table 5.

Table 5: Stormwater Infrastructure Condition Summary

Asset Type	Average Condition
Drainage Pipes	1.54
Drainage Pits	1.53
Gross Pollutant Traps	1.19
Underground Cells	1.13
Sumps	1.00

3.3 Conclusions and Recommendations

The City's ongoing inspection and age conditioning of its stormwater drainage assets is key to informing future upgrades

The useful life of each of the stormwater asset types and the deterioration rate factors used in the condition profile and evaluations are as shown in the table above. The corresponding intervention condition levels (which is an agreed trigger point at which a renewal of the asset component will be required) are also listed in the table above.

Concrete pipes, pits and GPT's are expected to last over 100 years and are not expected that there will be any significant impact on demand for upgrades due to condition in the short to medium term.

It should be acknowledged that there are some concerns with the Talis report used in this stormwater asset management plan (HPE 20/364050). Quantities of stormwater assets used in this report were extracted during the changeover of asset reporting systems resulting in dubious results. It is recommended that data validation should be programmed. Refer improvement action #2, Section 9.

4 LEVELS OF SERVICE

A key objective of this AMP is to identify the current level of service provided by the stormwater drainage assets. The level of service currently in practice will be used:

- To inform customers of the level of service they can expect.
- To develop asset management strategies to meet or continue to meet these levels of service.
- As a measure of the effectiveness of the City's asset management practices and the performance of this plan.
- To identify the costs and benefits of the services offered.
- To enable the City and customers to discuss and assess the suitability, affordability and equality of the existing service level and to determine the impact of increasing or decreasing this level in future.

Service levels are defined in terms of customer levels of service and technical levels of service. *Community Levels of Service* relate to how the community perceives the service in terms of safety, quality, quantity, reliability, responsiveness, cost/efficiency and legislative compliance.

Supporting the community service levels are operational or technical measures of performance. These technical measures, referred to as *Technical Levels of Service,* relate to the allocation of resources to service activities that Council undertakes to best achieve the desired community outcomes and demonstrate effective organisational performance.

Current stormwater maintenance activities have been based on statutory powers and duties contained in legislation, and precedents developed over time as a result of claims and legal proceedings. The adopted levels of service for Stormwater Assets are as shown below. These standards reflect current industry standards and include:

- Legislative Requirements (Section 4.1): Standards, Regulations, Acts and Council Local Laws that impact the way assets are managed.
- Community Levels of Service (Section 4.2): Defines specific levels of service which customers' desire and the organisation aims to achieve.
- Technical Levels of Service (Section 4.3): Current minimum levels of service based on technical grounds and current local government industry practice.

4.1 Legislative Requirements

The City has to meet a number of legislative requirements including Australian and State legislation and regulations. These are included in the Table 6:

Table 6: Legislative Requirements

Legislation	Requirement
Local Government Act 1995 and associated regulations	Sets out role, purpose, responsibilities and legal powers of local governments including the requirement for the preparation of a long term financial plan supported by asset management plans for sustainable service delivery.
Road Traffic Act 1974	Maintain unhindered access to road reserves and associated Transport infrastructure assets.
Occupational, Safety and Health Act 1984 and Regulations	Sets out roles and responsibilities to secure health, safety and welfare of pedestrians and road users.
Environmental Protection Act 1986 and Regulations 2004 & Environmental Protection and Biodiversity Conservation Act 1999	Sets out legislative requirements associated with the clearing of native vegetation and the protection of species and habitat associated with any clearing. Minimise impact on the environment as a result of infrastructure works.
Australian Standards	Duty of care to ensure minimum established industry standards are met.
Disability Discrimination Act 1992	Provides protection against discrimination based on disability, in this case in carpark and pathway facilities.
Aboriginal Heritage Act 1972 and Heritage Act of WA 1990	Minimise impact on heritage site as a result of infrastructure works.

4.2 Community Levels of Service

Community Levels of Service relate to how the community perceives the service in terms of safety, quality, quantity, reliability, responsiveness, cost/efficiency and legislative compliance.

The City's current community levels of service are detailed in the table 7

Table 7: Community Levels of Service

Key Performance Measure	Level of Service	Performance Measure Process	Performance Target
Quality/ Condition	Performance in providing and maintaining stormwater drainage facilities.	Customer complaints associated with drainage blockages	< 5 pa
Response times	Response time to customer requests.	Customer request responded to in accordance with Customer Service Charter	100% responded to in accordance with Charter
Safety	Provide a stormwater drainage system that is low risk to the community.	No. of insurance claims due to flooding associated with stormwater drainage runoff	0 claims per year

The performance against these levels of service is given in Appendix F

4.2.1 Customer Research and Expectations

The City conducts a Community Perception Survey generally every 2-3 years**,** which began in 2002/2003, to determine the following:-

- Overall satisfaction with the City;
- Perceived importance and satisfaction with services and facilities; and,
- Performance strengths, weaknesses and gaps.

The Community Perception Surveys undertaken in 2010, 2012, 2014, 2017 and 2020 did not make specific reference to stormwater drainage assets, but it was associated with transport assets. This includes new and upgraded stormwater assets included in road construction in capital works.

Services are rated by respondents on a on a five point scale known as the Performance Index Score (PIS).

The 2020 results of the Performance Index Score, in comparison to the previous year surveys, remained positive as summarised in Table 8 below:

Table 8: Performance Index Scores

Community Perception Surveys	2010	2012	2014	2017	2020	Industry Average
Building and maintaining local roads	57	56	58	54	58	53

The complete document can be found at HPE ref 20/130511.

- Building and maintaining roads – 58 overall satisfaction, which is consistent with previous year results. Performance is slightly above industry average of 53.

4.3 Technical Levels of Service

Supporting the community service levels are operational or technical measures of performance developed to ensure that the minimum community levels of service are met. These technical measures are shown in the table below:

Technical levels of service measures are linked to annual budgets covering:

- Operations and maintenance – the activities necessary to retain an asset as near as practicable to an appropriate level of service (e.g. maintenance including cleaning and structure repairs).
- Renewal – the activities that return the service capability of an asset up to that which it had originally (e.g. frequency and cost of stormwater drainage repair and maintenance). An asset is renewed when maintenance is no longer able to meet the required level of service.
- Upgrade/New – the activities to provide a higher level-of-service (e.g. flooding of roads and safety), to meet a higher demand.

Table 9 describes the different types of technical measures used

Table 9: Technical Measures

Service Criteria	Technical measures
Quality/ Condition	Clean, well maintained drainage pipes and pits enabling stormwater is easily removed from the road surface creating a safe and heathy neighbourhood.
Function	Pipes and pits to removal of stormwater from roads and car parks quickly and safely. Gross pollutant traps to remove dangerous wastes and litter from collected stormwater keeping the environment safe and healthy. Drainage sumps to collect stormwater from the network and remain both safe and visually pleasing.
Quantity	Good connectivity of the stormwater drainage network. Adequate stormwater infrastructure to keep a safe and healthy environment.

Service Criteria	Technical measures
Safety	Number of drownings associated with stormwater drainage assets

Table 10: Current Technical Service Levels

Key Performance Measure	Level of Service	Performance Measure Process	Performance Target
Quality/ Condition	Assets renewed before the end of their useful life.	No maintenance issues due to age and condition	No replaceable drainage with asset conditions greater than 8.
Function	Provision of stormwater collection pits to adequately remove stormwater from the road surface.	Provision of adequate stormwater drainage collection pits in accordance with minimum development guidelines.	All collection pits meet development guidelines
Cost effectiveness	Undertake preventative maintenance to reduce more expensive reactive maintenance	Percentage of maintenance classed as preventative	>70% preventative against reactive as measured using the AMIS
Safety	The safe and efficient removal of stormwater insuring roads are clean, safe and free of ponded water.	Routine safety inspection undertaken by maintenance staff.	Inspections undertaken in accordance with Engineering Maintenance Intervention Levels
	Response times to defects not exceeding thresholds defined in the Engineering Maintenance Intervention Levels[2]	Time to respond to routine safety inspection undertaken annually by maintenance staff.	Defects are investigated and responded to within allocated timeframes in 90% of cases

The performance against these levels of service is detailed in Appendix F.

A number of levels of service are not currently measured. Improve the measurement of relevant service levels through the increased capture and analysis of relevant data. Refer improvement action #4, Section 9.

4.4 Asset Levels of Service - Consultation Results

The City conducts community level of service consultation through the Community Perception Survey as outlined above. No formal consultation is completed regarding technical levels of service. The technical levels of service have evolved around safety and as a direct result of statutory powers and duties contained in legislation, and precedents developed over time as a result of claims and legal proceedings.

4.5 Conclusions and Recommendations

Although the data required to monitor and report on the City's specific performance in some areas is not currently available, it is considered that the current levels of service for stormwater assets are satisfactory and changes to these are unlikely to be required in the short term. Nevertheless, steps must be taken to measure current performance against the targets set in the table in Appendix F to enable definitive reporting of the City's overall performance. Refer improvement action #4, Section 9

5 LIFE CYCLE MANAGEMENT

The lifecycle management plan details how the City plans to manage and operate the assets at the established levels of service while optimising life cycle costs.

Stormwater assets are either gifted by the developers in new subdivisions or built/upgraded by the City to improve parts of the City's stormwater drainage network that are performing below target levels of service and to develop the drainage network to meet any future demand requirements. These assets are operated and maintained by the City throughout their useful life and their performance and condition are monitored to ensure that they deliver a satisfactory service to the community at an appropriate cost.

Figure 7: Asset Life Cycle (Source: IPWEA, 2015)

A summary of various activities undertaken during the life of drainage assets are detailed below. The parameters used in the estimation of life-cycle costs such as useful life, deterioration factors, intervention condition are shown in Appendix B.

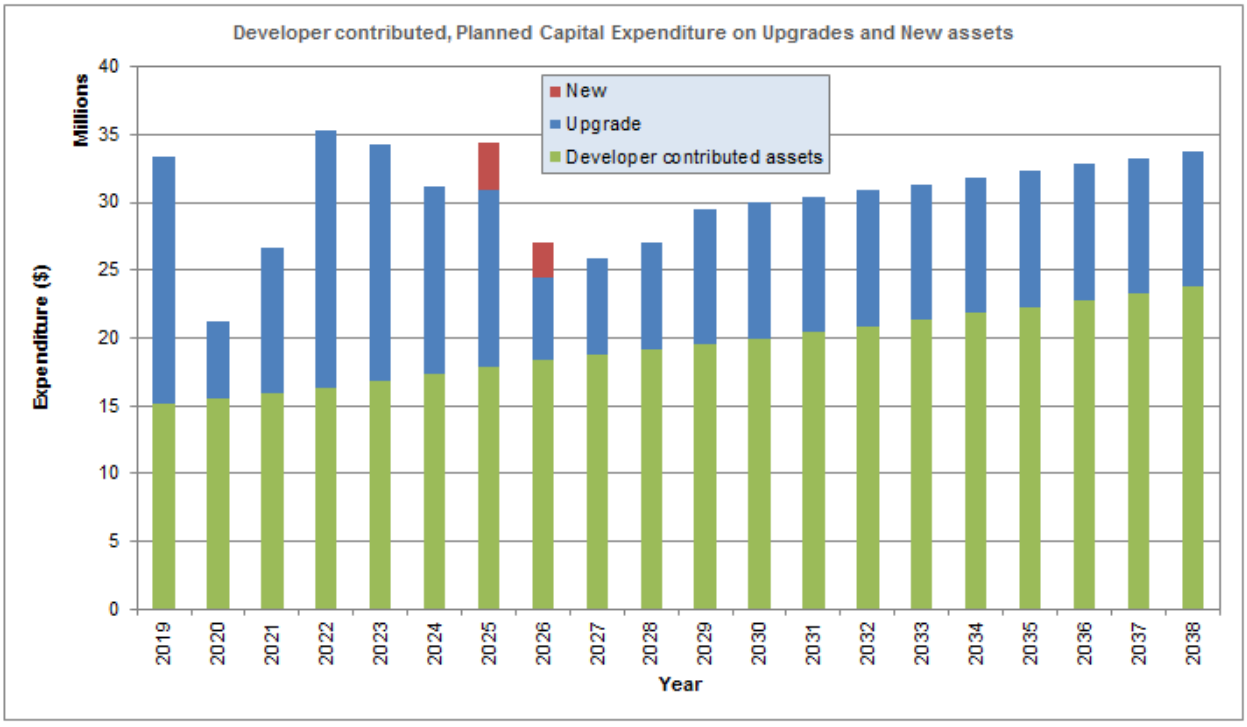
The ability to meet the defined levels of service is determined, in part, by how these assets are managed through their useful life. When assets do not perform as required, they are maintained, renewed, upgraded or disposed of. The recurrent maintenance works, the capital works of renewals and upgrades, and the one-off creations and disposal work form part of the activities required to provide a satisfactory level of service.

5.1 Creation/Acquisition/Upgrades

As a growth council, a significant amount of new stormwater drainage assets such as pipes and pits, are gifted annually through subdivision developments. An allowance is made to account for this growth as part of the development of the LTFP.

Figure 8 shows the anticipated growth and planned expenditure on new and upgrade of transport assets over the next 20 years. The majority of transportation projects will also have a stormwater drainage component. It is very difficult to separate the stormwater vs transportation components of these projects. These costs have been allowed for in the Transport Infrastructure AMP (TIAMP). Future iterations of this SWAMP should consider whether there would be benefit in combining the TIAMP and SWAMP into one document due to these difficulties in separating costs. Refer improvement action #5, Section 9.

Figure 8: Developer contributed, Planned Capital Expenditure on Upgrades and New Assets



From 2029 onwards, placeholder projects have been included (based on average historical expenditure) as details of future projects have not yet been fully determined. Details of proposed creation/acquisition and upgrade works are provided in the Stormwater Drainage Assets – Capital Sub Program in Appendix E.

As the City grows and expands, new ideas and concepts involving sumps are put forward for consideration. Some ideas are new and some may resurface from the past. The old practice of planting trees within sumps to assist in the disposal of stormwater drainage with the bonus of the

beautification of the sumps has been proposed. There are maintenance issues, with this practice, but there is potential for a better outcome. There may be a need for the investigation of inclusion of “Tree Planting” into a long term plan for the sumps and drainage swales when developing the City’s 2025 stormwater asset management plan. This will need to be done in such a way as to not create maintenance issues.

A new proposal for the replacement of existing sumps with alternative water sensitive drainage solutions such as Rain Gardens and Biofilters along with underground cells has also been put forward for consideration. Natural drainage solutions can improve the environment both physically and aesthetically. The expanded use of underground cells replacing sumps can also make available new building lots which can offset the cost of these new drainage solutions.

Options will need to be investigated on a case by case basis and works required programmed accordingly. Refer improvement action #6, Section 9.

5.2 Operations and Maintenance Planning

Operations and maintenance is the regular on-going work that is necessary to keep assets at an acceptable level of service, including instances where portions of the asset fail and require immediate repair to make the asset operational again. Maintenance includes reactive, planned and cyclic maintenance work activities.

Assessment and prioritisation of reactive maintenance is undertaken by the City’s Assets Maintenance team using experience and judgement. The City has many maintenance tasks and activities that are associated with the maintenance of stormwater drainage assets. A large proportion of these procedures are well documented. However, integration of these activities with a dedicated system is currently underway.

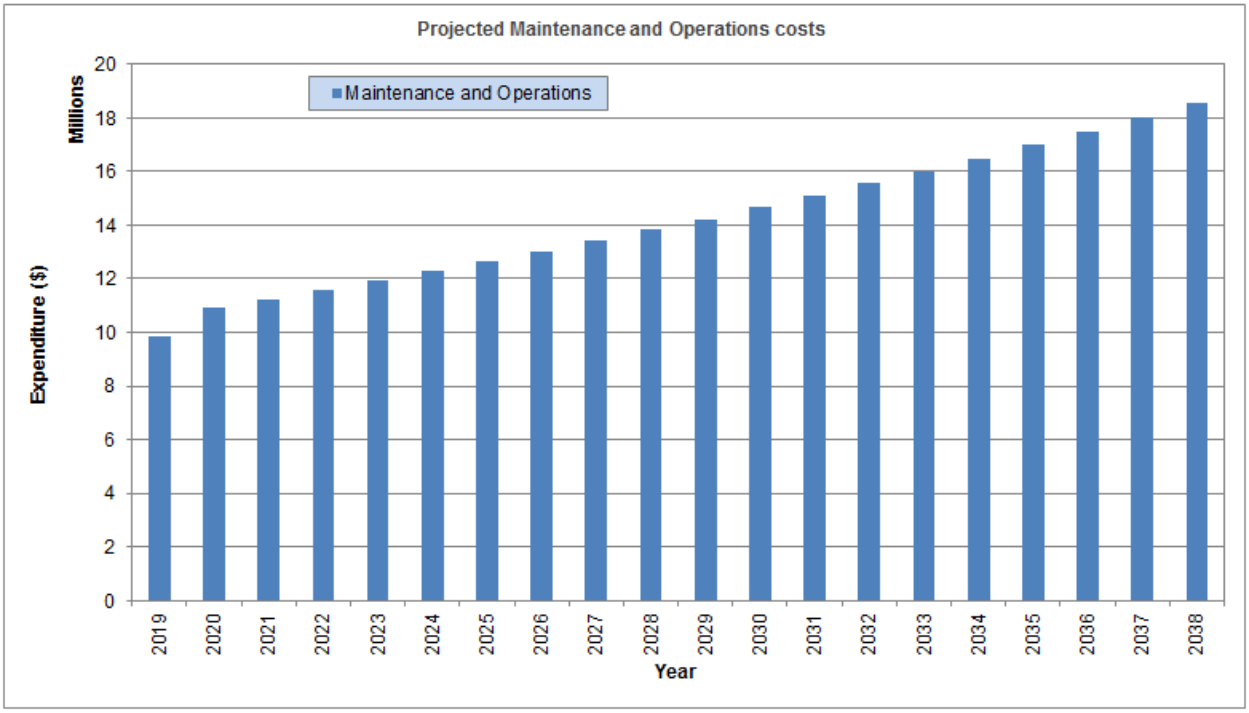
In order to meet the requirements of ISO 9000 and ISO 55000 standards, these processes and procedures will need to be clearly documented and integrated with an Asset Management Information System (AMIS). The City has commenced the identification and mapping of maintenance activities and their relationship to the other asset management activities. The work being undertaken includes defining and storing the associated procedures with PROMAP software

In support of this AMP, a Stormwater Drainage Asset Maintenance Management Plan will need to be developed for drainage assets detailing the maintenance activities that are required to meet the agreed levels of service. This Plan will include documenting the process and procedures, determining the resources required and the estimated cost to maintain the drainage asset stock. It is likely that there will be one plan that considers both transport and stormwater drainage maintenance. Refer to improvement action #7, Section 9.

Using 2019/20 maintenance expenditures as the reference level, the future operational and maintenance expenditure forecast for transport and drainage has been estimated, as shown in Figure 9. The forecast is shown combined for operational and maintenance as it is not possible to split these historic expenditure figures under the current financial system.

Figure 9: Planned 20 Year Operations and Maintenance Expenditure

Note: Data is based on the 2019/20 twenty Year LTFP growth projections – does not include inflation



Note that all costs are shown are in current 2020 dollar values.

The current maintenance expenditure level is considered inadequate to meet some of the required levels of service such as response times. Shortage in maintenance funding continues to be evaluated in conjunction with the development of the Maintenance Management Plan. The results of this work will inform future revisions of this AMP.

The current LTFP makes an allowance of a 3% increase in the annual operations and maintenance budget to trend in line with the increased value of the asset stock resulting from growth.

Improvements in the capture of maintenance expenditures and linking these to service levels is required to enable more accurate drainage asset maintenance expenditure forecasts to be determined. Refer improvement action #8, Section 9. The AMIS, which is currently being implemented will assist to address this shortcoming.

5.3 Renewal

The City does not currently have a stormwater drainage asset renewal program. Any renewal funding for drainage renewal is derived from the transport asset renewal program.

This will need to be further analysed into the future. Refer improvement action #9, Section 9.

A future annual asset renewal program will be developed and prioritised based on the following criteria:

- the overall age and condition of the assets and its components,
- the ongoing maintenance demand,
- works being aligned where possible by location or locality (to take advantage of cost efficiencies through economies of scale). This will also have the effect of minimising inconvenience to residents in the area. This may result in an asset being renewed slightly before or after expiration of useful life, and
- community requests and concerns.

It is noted that stormwater assets generally have a 100 year life. With the majority of the City's assets installed post 2000, renewal will not be required for a number of years.

5.3 Disposal

Disposal requirements are assessed on an individual case-by-case basis.

5.4 Standards and Specification

The standards and guidelines used in constructing and maintaining stormwater drainage assets are listed below:

- Auspec Construction Standards
  - C220 – Stormwater Drainage – General
  - C221 – Pipe Drainage
  - C222 – Precast Box Culverts
  - C223 – Drainage Structures
  - C224 – Open Drains
- Local Government Guidelines for Subdivisional Development (IPWEA, 2016):
  - LPP 4.1 Wetlands
  - LPP 4.3 Public Open Space
  - LPP 4.4 Urban Water Management
- City of Wanneroo Drainage Specifications
  - D5 – Stormwater Drainage Design. (HPE 15/557866[v4])
- Australian Standards:
  - AS 1254 – Unplasticised PVC (uPVC) pipes and fittings for stormwater or surface water applications.

- AS 2032 – Code of practice for installation of uPVC pipe systems.
- AS 3725 – Loads on buried concrete pipes.
- AS 4058 – Precast concrete pipes.
- AS 4139 – Fibre reinforced concrete pipes and fittings.

- The City's Guidelines and Standard Drawings:
  - TS 01-2 – Sump Security
  - TS 01-6 – Drainage Sump Site Sign
  - TS 03-1 – Outlet Structure Details
  - TS 03-2 – Headwall Details
  - TS 03-3 – Junction Pit Construction Details
  - TS 03-4 – Sump and Sump Outfall Details
  - TS 03-5 – Gully / Junction Pit Modified – Trapped and Untrapped Gullies
  - TS 03-6 – At Grade / Table Drain – Inlet / Outlet Structure
  - TS 03-7 – Side Entry Pit – Type 1 (Plain Slab)
  - TS 03-8 – Side Entry Pit – Type 2 (Deflector Slab)
  - TS 03-9 – Side Entry Pit – Type 3 (Combination Side Entry Pit and Grated Entry)
  - TS 03-10 – Side Entry Pit – Type 4 (Combination Side Entry Pit and Flush Entry)

These standards were taken from "Wanneroo Development Design Specification – WD5 – Stormwater Design". HPE 15/557866[v4]

5.5 Conclusions and Recommendations

The life cycle management of stormwater drainage can be improved with the following actions. From Figure 8 and 9, it is noted that the majority of transportation projects will also have a stormwater drainage component. As these have been allowed for in the Transport Infrastructure AMP (TIAMP), the recommendation is that future iterations of this SWAMP to combine the TIAMP and SWAMP to a single comprehensive AMP. Refer improvement action #6, Section 9.

- In support of this AMP, to meet the agreed levels of service, a Stormwater Drainage Asset Maintenance Management Plan will need to be developed for drainage assets detailing maintenance activities. It is recommended that this Plan will include determining resources to establish process and procedures to estimate costs to maintain the drainage asset stock. This may be combined with the Transport Asset Maintenance Management Plan. Refer improvement action #7, Section 9.

- To enable more accurate drainage maintenance expenditures, it is recommended to improve maintenance capture methods. The AMIS, which is currently being procured will assist to address this recommendation. Refer improvement action #8, Section 9.

- It is recommended to investigate establishing a stormwater drainage asset renewal program separate from the transport asset renewal program (especially if the TIAMP and SWAMP remain separate documents). Refer improvement action #9, Section 9.

6 RISK MANAGEMENT

An assessment of risks associated with the delivery from stormwater assets has identified critical risks to the City in accordance with the City's Risk Assessment Criteria Matrix. The risks are summarised in Appendix G.

The risk assessment process identifies the following:-

- credible risks,
- the likelihood of the risk event occurring,
- the consequences should the event occur,
- developing a risk rating,
- evaluating the risk, and
- developing a risk treatment plan for non-acceptable risks.

Critical risks identified in this plan, being those assessed as 'High' – items prioritised corrective action. Other risks identified in this plan include those assessed as 'Moderate' – items requiring moderate corrective action and 'Low' – items requiring performance monitoring or corrective actions with a low priority rating subject to available resources.

6.1 Asset Criticality

Critical Assets

Critical assets are those assets which have a high consequence of failure but not necessarily a high likelihood of failure. By identifying critical assets and critical failure modes, organisations can target inspection activities, maintenance plans and capital expenditure plans at the appropriate time and level of importance.

A register of high risk Stormwater Drainage assets will be prepared. This will involve the investigation and identification of all high flood risk areas and high consequence areas within the City. This will result in the preparation of a prioritised listing for the development of a stormwater drainage pipe inspection program. Refer improvement action #10, Section 9.

Operations and maintenances activities target critical assets to prevent failure and maintain service levels. Critical asset failure modes and required operations and maintenance activities are detailed in Table 11.

Table 11: Critical Risks and Treatment Plans (VH-Very High, H-High, M-Medium, L-Low)

Risk Element	What can Happen	Risk Rating (VH,H,M,L)	Risk Treatment Plan
Underground Pipe blockages	Road and/or, property flooding. Damage to road structure, property and scouring of embankments resulting also in unsafe roads conditions for both vehicular and pedestrians.	L	Pipes Inspections to be carried out on critical assets. Critical assets to be defined. Refer improvement action #10, Section 9.
Drainage pit blockages		L	The cleaning of drainage pits to be scheduled prior to winter.
Underground Pipe damages		L	Pipes Inspections to be carried out on critical assets. Critical assets to be defined. Refer improvement action #10, Section 9.
Inadequate drainage systems to convey stormwater runoff to safe location		L	Drainage flooding locations to be recorded and investigated. Any remediation works to be programmed. Refer improvement action #10 Section 9.
Inadequate stormwater runoff escape route or blocked passages.		L	Drainage flooding locations to be recorded and investigated. Any remediation works to be programmed. Refer improvement action #10 Section 9.
Gross Pollutant Traps uncleaned and choked	Blockage	H	GPT's to be located and maintained as per manufacturer's instructions. Refer improvement action #12 Section 9.
Storm events greater than design event.	Inlet pit and pipe capacity exceeded. Pit surcharges, pit lids dislodging under pressure. Overland flows can cause local flooding and damage to property.	L	When capacity is exceeded as evidenced by flooding events, investigate overland escape route options and alternative runoff disposal sites.
	Capacity exceeded at outlet sump, underground cells and swale causing overflows	L	When capacity is exceeded as evidenced by flooding events, investigate overland escape route options and alternative runoff disposal sites.
	Underground Cells unable to cope with volume of runoff	M	Undertake stormwater master planning to determine areas in need of critical upgrade. Refer improvement action #10 Section 9.

Risk Element	What can Happen	Risk Rating (VH,H,M,L)	Risk Treatment Plan
Silting of Underground Cells – loss of permeability qualities.	Loss of permeability qualities which will reduce the capacity of the system and increase likelihood of failure during consecutive storm events. Flooding of upstream system may occur.	M	Include in the design of underground cell systems, a cleansing unit to remove as much gross pollutant and silt from the stormwater runoff as possible before it enters the underground cells. Refer improvement action #12 Section 9. Undertake cleaning of the pre cleansing units in accordance with manufacturer recommendations. Undertake programmed condition inspections of the underground cell using CCTV systems. Refer improvement action #13 Section 9.
Fencing damage	Inadvertent public access to sump site is unsafe. Steep slope and the possible hazardous nature of silt left at the base of the sumps.	L	Programmed inspections of sump sites to monitor sump and fencing conditions. Program repairs as a matter of priority.

6.2 Recommendations

The following recommendations are to be considered.

- To prepare a register of high risk Stormwater Drainage assets. This will involve the investigation and identification of all high flood risk areas and high consequence areas within the City resulting in the preparation of a prioritised listing for the development of a “Stormwater Inspection Program”. This could form part of the SDA Maintenance Implementation Plan Refer improvement action #10 Section 9.

  A “Stormwater Inspection Program” to be further developed for the continual inspection and recording of all “stormwater” identifying critical assets. The definition of “critical assets” may contain areas of continual flooding. Method for inspection to include the use of CCTV systems as well as site inspections. The result of this program will reduce the risk of blockages in underground pipes and pits by the scheduling of frequent prioritised cleaning and maintenance prior to winter. Any remediation works including the upgrades of stormwater systems and sump fencing to be programmed.

- GPT’s and Underground Cells to be located and maintained as per manufacturer’s instructions. Refer improvement action #11 Section 9.
- Incorporating in the design of underground cell systems, a cleansing unit to remove as much gross pollutant and silt from the stormwater runoff as possible before it enters the underground cells. This action will reduce maintenance expenditure and possible replacement of cells. Refer improvement action #12 Section 9.

7 FUTURE DEMAND

7.1 Demand Drivers

Drivers affecting demand include but are not limited to population change, changes in demographics, seasonal factors, consumer preferences and expectations, technological changes, economic factors, agricultural practices, environmental awareness.

Demand for new services with respect to stormwater will be in the form of requests associated with:-

- District Distributor Road upgrades and extensions,
- New or existing facilities that require new or additional car parking areas and associated stormwater infrastructure
- Conversion of sumps to piped networks and underground infiltration cells to free up land for other purposes or to beautify an area as explained in section 5.1.
- A new proposal for the replacement of existing sumps where possible with alternative water sensitive urban design such as Rain Gardens and Biofilters has been put forward for consideration from the community as outlined in section 5.1

7.2 Demand Management Plan

The City will need to ensure that the factors associated with future demand are considered in the planning and determination of the LTFP.

The present position and projections for demand drivers that may impact future service delivery and utilisation of assets are documented in Table 12.

Table 12: Demand Drivers, Projections and Impact on Services

Demand Drivers	Present Position	Projection	Impact on Services	Demand Management Plan
Population growth	206,860 (2020)*	348,880 (2041)*	Increased road traffic and heavy vehicle movements result in the dualling and widening of roads. Increased road surface areas require an upgrade of stormwater systems.	Continue to source non-Council funding e.g. from developer contributions or State/Federal Governments to reduce the impact of associated costs on local rate payers.
			Increased population will increase demand for car parking spaces, particularly within town CBD areas. This will result in additional stormwater runoff placing pressure on the existing network.	Continue to source non-Council funding
			Associated future subdivision development will result in additional new assets being handed over to Council from developers. This will result in additional drainage maintenance demands in the future.	Continue to source non-Council funding
			Demand for wider pathways, improved pedestrian crossings, and improved parking accessibility at new facilities. This results in additional stormwater runoff placing pressure on the existing network.	Continue to source non-Council funding

Demand Drivers	Present Position	Projection	Impact on Services	Demand Management Plan
Public demand for aesthetically pleasing infrastructure.	Many sumps and swales un the City.	To be Investigated.	Re-design of existing sumps and swales to accommodate public demand.	Continue to source non-Council funding.
Public demand for water sensitive urban design.	Small numbers of Bio-filters within the City.	To be Investigated.	Re-design of existing sumps and swales to accommodate public demand.	Continue to source non-Council funding.
Demand for stormwater discharge points to water bodies to be free of pollutants.	Not all outfalls in the City have GPT's installed.	To be Investigated.	Installation of GPT's immediately before all outfalls in the City.	Continue to source non-Council funding.

*Appendix D contains the latest population growth information.

7.3 Recommendations and Improvements

The following are recommendations for improvement from Demand Drivers.

- As the City grows and expands, ideas and concepts involving sumps are put forward for consideration. Some ideas such as the planting of trees within sumps to assist in the disposal of water are no longer practiced because of maintenance issues. With the addition of GPT's and more natural in-line filters installed prior to the sump, tree planting can be added to the long term plan for sumps and drainage swales. Refer improvement action #13 Section 9.

8 FINANCIAL SUMMARY

This section contains the current financial requirements resulting from all the information presented in the previous sections of this AMP. The financial projections will be updated as further information becomes available.

8.1 Fair Value

The value of depreciable stormwater as at 30 June 2020 is summarised below. Assets have been valued at brownfield rates. Revaluations for financial purposes are conducted once every 3 years. Depreciated Replacement Costs are calculated using straight line depreciation methods.

Table 13: Stormwater Drainage assets depreciable values

Asset Component	Replacement Cost ($)	Current Replacement Cost (Depreciated Replacement Cost) ($)	Predicted Depreciation Expense 2020/21
Drainage Pipes	$228,608,395	$187,135,083	$2,286,083
Drainage Pits	$99,153,453	$17,249,766	$991,535
Underground Cells	$139,325	$127,230	$1,393
Gross Pollutant Traps	$12,428,239	$11,126,202	$124,282
Sump	$111,884,476	$-	$-
Grand Total	**$452,213,888**	**$215,638,281**	**$3,403,293**

Asset valuation figures have been taken from Talis' 2020 Infrastructure Asset Valuation report (HPE 20/364035)
Note that Sumps do not attract a "Depreciation" cost.

8.2 Key Performance Indicators

The key performance indicators (KPIs) for the combined transport and stormwater assets are shown in Table 14 below. These are currently not able to be calculated for stormwater alone, hence the recommendation to combine the TIAMP and SWAMP (refer improvement #5)

Table 14: Asset Ratios as at 30 June 2020

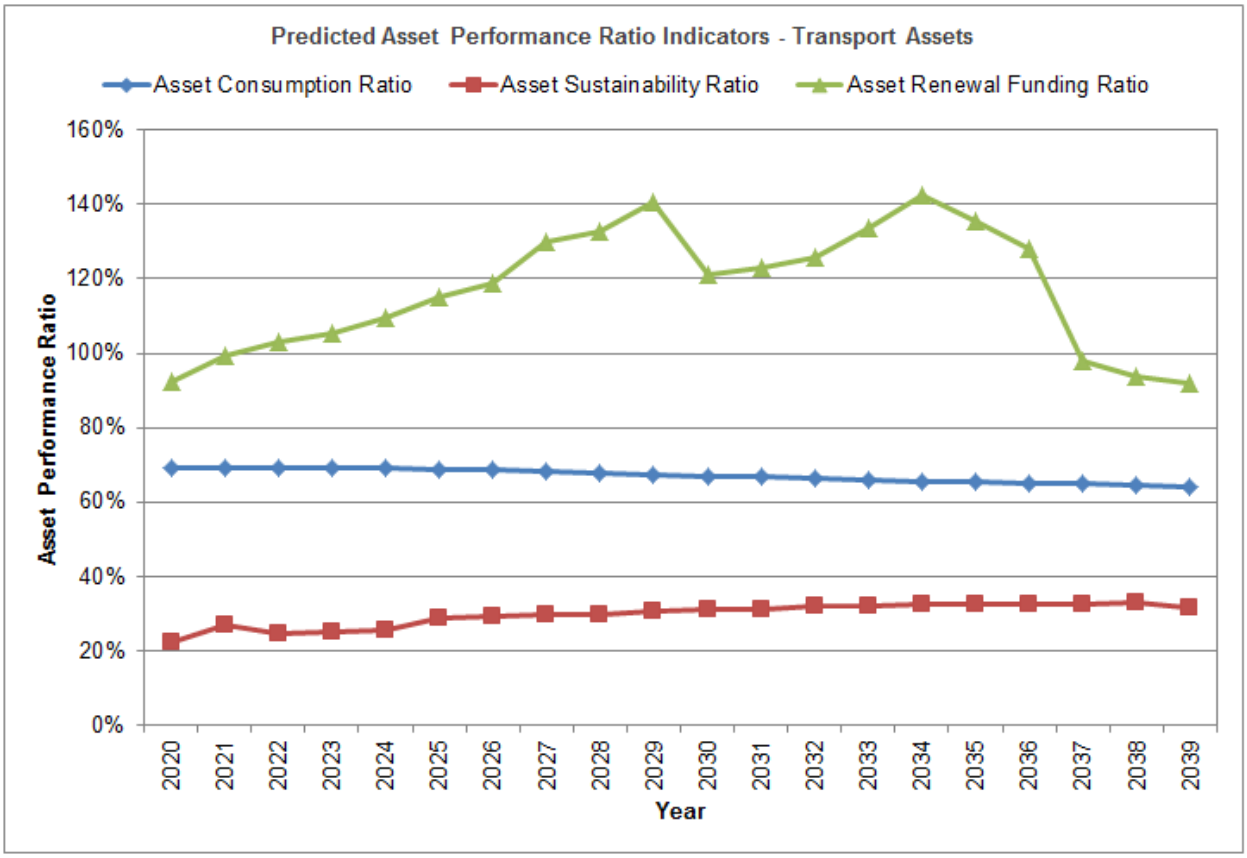
Key Performance Indicator	Measure	Ratio
Asset Consumption Ratio (ACR)	Depreciated Replacement Cost / Replacement Cost	69.4%
Asset Sustainability Ratio (ASR)	Capex on Renewal & Replacement / Depreciation Expense	22.4%
Asset Renewal Funding Ratio (ARFR)	Net Present Value (NPV) of Planned Capital Expenditure on Renewals / NPV of required capital expenditure on renewal over a ten year period	92.4%

These rations calculated for a single year do not provide very useful output. However, when the ratios are measured over a period of time, they provide valuable information for the City to understand how well the current financial plan is meeting its long term renewal demand obligations.

It is considered that the City's results are not unusual for a City with high growth (represented by high upgrade and expansion expenditures) and a major proportion of its assets in the early stages of their life (particularly with long life road pavements) coupled with new gifted assets from land development.

Figure 10 below details the long term performance of these ratios, using the current 2019/20 budget and the 2019/20 draft LTFP, measured against the asset renewal demand predictions.

Figure 10: Predicted Asset Performance Ratios as a result of the current LTFP



The **ACR** is estimated at 69.4% in 2019/20 due to a large stock of assets being relatively new. This ratio is likely to remain within the 60% – 70% range due to a high level of new transport assets gifted to the City through land development.

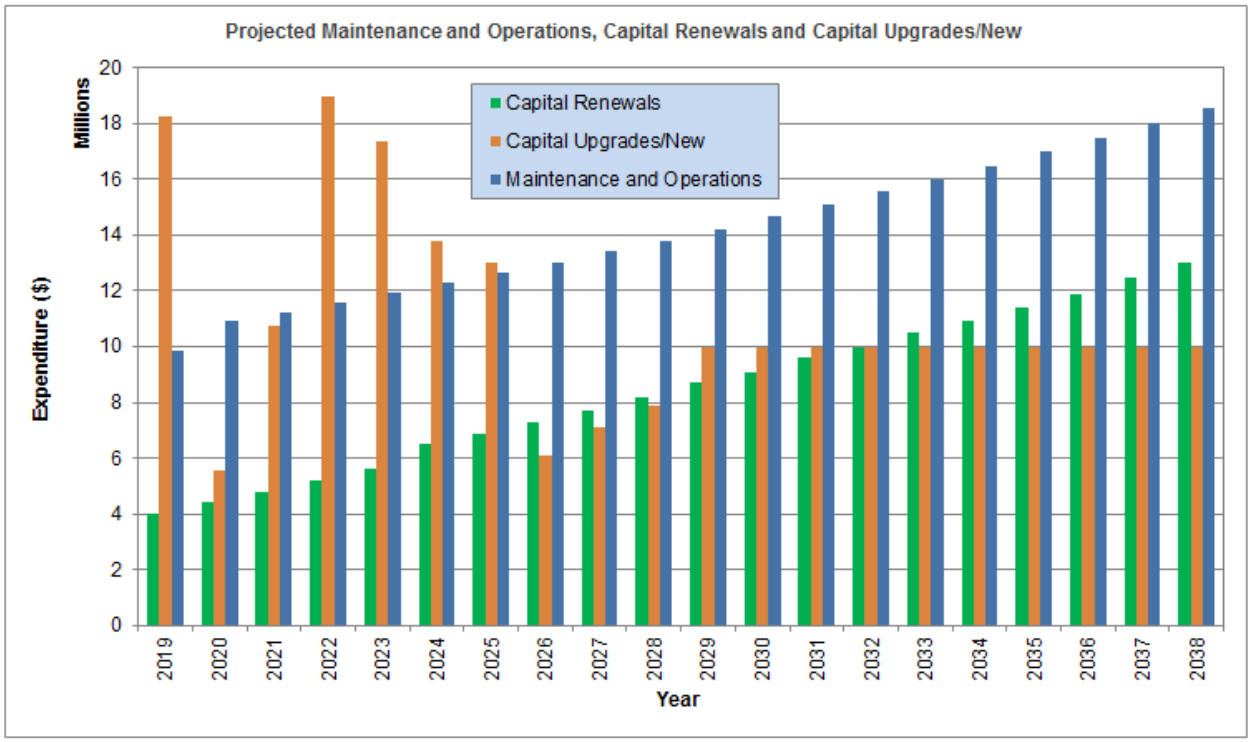
The **ASR** is estimated at 22.4% in 2019/20 with projected ratios ranging from 24% to 34% over the 20 year planning period. The Department of Local Government, Sport and Cultural Industries (DLGSCI) explains that a ratio of 100% indicates that asset stock is being replaced at a sustainable level but also recognises this figure may be 50% or less when asset portfolios are young. With the City's current mix of old and new assets and continued high growth, the ASR figure is expected to remain low. As growth declines and the asset stock ages, this ratio is expected to increase to values equivalent to fully established Local Governments.

The **ARFR** is estimated at 92.4% in 2019/20 and shows a steady rise until 2029 when it peaks at 140.7. This suggests that adequate funds are being allowed for in the LTFP to meet the increase in asset renewal demand. This ratio will vary from year by year, potentially creating different short term and long term renewal funding needs

8.3 Current Funding Levels

The financial expenditure projections for transport assets are shown in Figure 11 below. Stormwater figures are contained within these projects as discussed previously.

Figure 11: 20 Year Planned Expenditure for Transport and Stormwater Drainage Assets



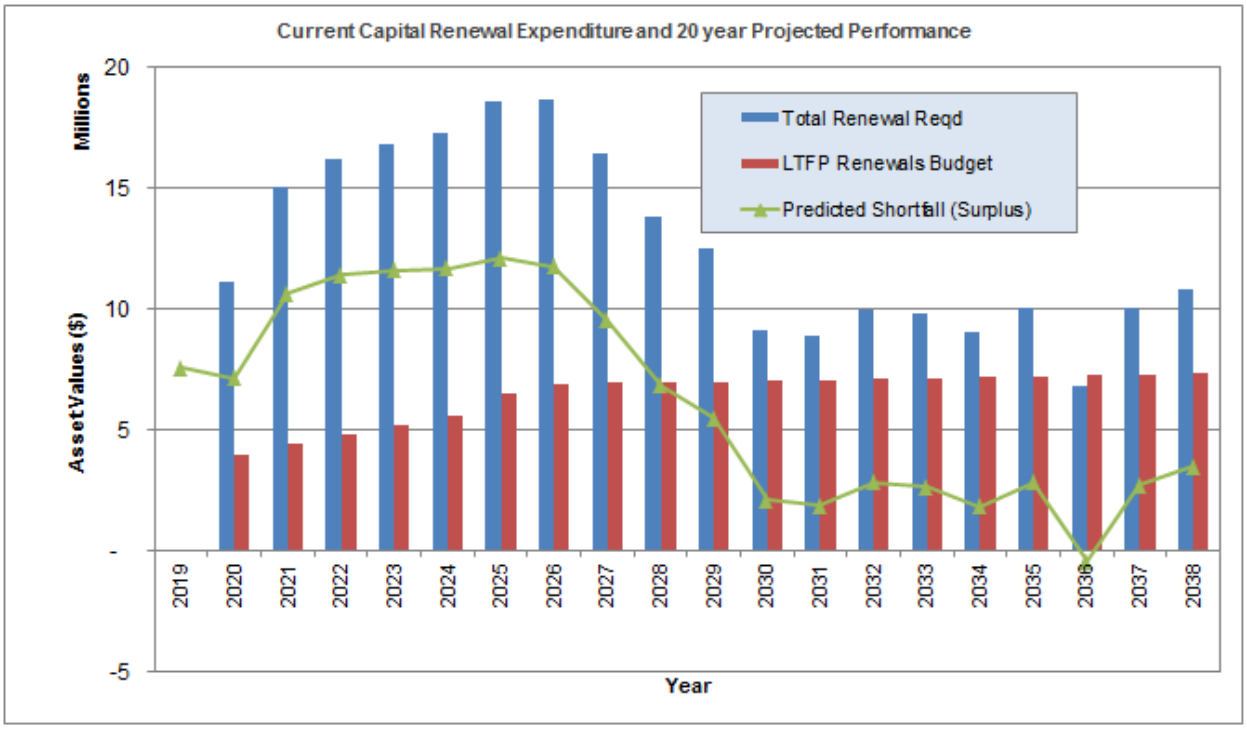
The predicted 20 year maintenance and operations cost figures are expected to increase as the cost to maintain existing assets increases. These costs are also inclusive of an estimated 3% annual increase to allow for growth and material costs.

The funding strategy associated with capital asset renewal is further discussed in the next section.

5.3 Funding Gap Analysis

The predicted impact of the current renewal expenditure in the LTFP is depicted in Figure 12 including the predicted magnitude of resultant unfunded renewals in future years. This contains figures for both stormwater and transport.

Figure 12: Current Capital Renewal Expenditure and 20 year Projected Performance



Instead of funding the spikes in renewal demand, the City‘s plan is to progressively increase its renewal funding over the long term to address the shortfall. Renewals will be prioritised and wherever possible, assets that reach intervention levels will be maintained at a safe condition until such time funding availability catches up.

Based on the current predicted deterioration patterns, the magnitude of unfunded renewals is predicted to surpass $7.0M from 2020 onwards and peak to 12M in 2025 before starting to fall from 2026 onwards.

It is anticipated that there will be significant increases in the renewal demand requirement after the first 20 years (i.e. after year 2038) due to the ongoing aging of the transportation network.

The City will closely monitor the impact of future demands every year to ensure that appropriate renewal funding strategies are put in place to meet the growing predicted renewal demand and ensure that the magnitude of any funding shortfall continues to be kept at manageable levels.

Renewal funding allocations will be expended on a priority basis based on the condition of each asset as outlined in Section 5, Life Cycle.

8.5 Funding Sources

Current funding sources available for stormwater assets include:

- The City's rates,
- Depreciation (collected through rates),
- Developer Contributions – through Town Planning Schemes,
- Loans, and;
- Reserves.

8.6 Conclusions and Recommendations

The impact of the deferral of renewals and the ability of stormwater drainage assets to still provide the required level of service will continue to be assessed. These will be monitored regularly for risk with appropriate maintenance measures put in place.

9 IMPROVEMENTS, MONITORING AND REVIEW

9.1 Performance Monitoring

The effectiveness of the AMP can be measured in the following ways:

- The degree to which the identified cash flow predictions are incorporated into the LTFP and Strategic Community Plan (SCP).
- The degree to which the 1 to 5 year detailed works programs, budgets, business plans and organisational structures take into account the overall works program trends provided within this plan.
- Delivery of better services as a result of improved efficiencies in the management of assets.
- Reporting results against the Department of Local Government's Integrated Planning Framework and using this information to better inform decision making.
- Achieving the intended outcomes of the improvement plan.

9.2 Improvement Plan

The asset management improvement plan generated from this AMP is shown in Table 15.

9.3 Review Procedures

This plan has a life of four years whereby a comprehensive review will be undertaken following this period and will be endorsed by the Asset Management Steering Group.

It is intended that this AMP is a live document which is relevant and integral to the daily asset management activities at the City. To ensure the plan remains useful and relevant, the following process of monitoring and review activities will be undertaken subject to availability of resources:

- Review the plan annually to reflect changes to work programs, outcomes of service level reviews and incorporate new knowledge resulting from the AM improvement program;
- Quality assurance audits of AM information to ensure the integrity and cost effectiveness of data collected;
- Benchmarking with comparable councils – maintain performance of Asset Management practices in comparison to other Local Governments.

The annual and LTFP projections detailed in this plan have intentionally been included in the Appendices. This is to allow for these individual sections of the Appendices to be updated individually (without affecting the core AM practices of the Plan) on an annual basis and extracted to inform the long term planning for this class of asset. Until such time a full review of this Plan is undertaken, the core data included in this plan is located in HPE 20/364050 and will be updated as new versions annually to inform the LTFP.

Table 15: Improvement Plan

AM – Assets Maintenance, LD – Land Development, AP – Asset Planning, ICW – Infrastructure Capital Works, CIS – Customer & Information Services, TS – Traffic Services

Task No	Task	Responsibility	Resources Required	Proposed Completion date	Progress Comment
1.	Implementation of Assetic (AMIS) to enable asset data to be stored in a corporate system.	CIS & Assets including AP	Internal	2022/23	This is being progressed as part of the Enterprise Software Renewal Program.
2.	Complete validation of all stormwater data Importation of data to AMIS has shown that there are some gaps in data and that data validation needs occur.	AP	Internal	2022/23	Validation of existing data is required. Collection/validation of water sensitive urban design data is required
3.	Introduce asset collection utilising the D-Spec format for capital works projects	ICW, AM	Internal	2022/23	Started with outsourced projects only and those where budget available. All projects by 2022/23
4.	Improve the measurement of relevant service levels through the increased capture and analysis of relevant data.	CIS via new CRM system	Internal	2024/25	By completion of next revision of AMP
5.	Investigate future iterations of this SWAMP to combine the TIAMP and SWAMP to a single comprehensive AMP	AM	Internal	2024/25	
6.	Investigation the use of sumps and possibly replacing sumps with alternative	AM, EM	Internal	2022/23	

Task No	Task	Responsibility	Resources Required	Proposed Completion date	Progress Comment
	water sensitive drainage solutions or consolidation of existing sumps				
7.	Define and formalise intervention levels for maintenance activities on stormwater assets through a Maintenance Management Plan, possibly combined with transport	EM	Internal	2024/25	
8.	Enable accurate drainage maintenance expenditures to improve maintenance capture methods.	EM, AM	Internal	2022/23	Procurement of AMIS will assist.
9.	Investigate establishing a stormwater asset renewal program separate from the transport asset renewal program	AM	Internal	2022/23	Only required if the TIAMP and SWAMP are not combined
10.	Develop a register of high risk Stormwater assets to identify possible future problem areas and from this develop an infrastructure inspection programme.	AM	Internal	2024/25	In conjunction with Improvement Action #7
11.	GPT's and Underground Cells to be located and maintained as per manufacturer's instructions	AM, EM	Internal	2021/22	
12.	Investigate the installation of filters prior to Underground Cell to minimize contamination.	AM, EM, ICW	Internal & external	2023/24	

Task No	Task	Responsibility	Resources Required	Proposed Completion date	Progress Comment
13.	Investigation into practice of tree planting in Sumps and Swales	AM, EM, ICW	Internal	2022/23	Investigate in conjunction with improvement action #6
14	Investigate options to use smart technology to monitor stormwater	AP	Internal	2022/23	

10 REFERENCES

Council Asset Management Related Documents

- Asset Management Policy (HPE #16/106984)
  https://www.wanneroo.wa.gov.au/downloads/file/80/asset_management_policy
- Asset Management Strategy (HPE #16/279441)
  https://www.wanneroo.wa.gov.au/downloads/file/3254/asset_management_strategy_-_2018
- Corporate Business Plan (CBP) (HPE #19/377777)
  https://www.wanneroo.wa.gov.au/downloads/file/2643/corporate_business_plan_201718_-_202021
- Long Term Financial Plan (LTFP) (HPE#18/512338)
  https://www.wanneroo.wa.gov.au/downloads/file/3265/long_term_financial_plan_201920%E2%80%93203839
- Strategic Community Plan (SCP) (HPE #17/361793)
  https://www.wanneroo.wa.gov.au/strategiccommunityplan
- Roadworks Excavation within Road Reserves Policy (HPE #18/488322)
  https://intranet.wanneroo.wa.gov.au/documents/88/roadworks-excavation-within-road-reserves-policy

Council Planning Documents

- City of Wanneroo Transport Strategy 2019/20 (HPE #19/365476)
  http://www.wanneroo.wa.gov.au/downloads/file/3447/transport_strategy
- Population Forecast - City of Wanneroo Community Profile (.id population experts website - *http://profile.id.com.au/wanneroo/population*)

Asset Management Guidance

- 'Practice Note 1: Footpaths & Cycleways', IPWEA – v2 2014.
- 'Practice Note 11: Street Lighting', IPWEA – 2014.
- 'Practice Note 2: Kerb & Channel (Gutter)', IPWEA – v2 2014.
- 'Practice Note 6: Long Term Financial Planning', IPWEA – 2012.
- IPWEA, 2015, 'Australian Infrastructure Financial Management Manual', Institute of Public Works Engineering Australia – 2nd Edition, 2015.
- IPWEA, 2015, 'International Infrastructure Management Manual', Institute of Public Works Engineering Australia - 5th Edition 2015.

11 GLOSSARY OF TERMS AND ABBREVIATIONS

Definitions: The following terms are used in this AMP.

"**Assets**" are future economic benefits controlled by the City as a result of a past transaction or event whereby:

- Its value can be measured reliably, and;
- Its value must exceed a stated materiality threshold being $5,000 or form part of a network asset group, and;
- It must be probable that future economic benefits of the asset will eventuate (i.e. the asset acquired supports the delivery of Council services to the community in line with its objectives).

ISO 55000 defines an '***Asset***' as an item, thing or entity that has potential or actual value to the organisation

"**Asset Management**" refers to the combination of management, financial, economic, engineering and other practices applied to assets from their planning, acquisition, operation, maintenance, replacement and disposal, to ensure that the assets meet the priorities of the Strategic Community Plan with the objective of providing the required level of service in the most cost-effective manner.

ISO 55000 defines an '***Asset Management***' as the coordinated activity of an organisation to realise value from assets

"**AM Plan**" (Asset Management Plan or AMP) refers to documented information that specifies the long term plan, activities, program, time scales and resources applied to specific individual major, critical assets or a grouping of assets to provide a defined level of service over the lifecycle of the asset. An AMP covering a grouping of assets (or asset classes) is referred also as an ***Asset Class Plan***.

"**Asset Class Plan**" or '**ACP**' refers to an AM Plan that covers a class of assets, grouping of assets or a network of assets as opposed to a specific individual major or critical asset.

"**AM Information System**" or '**AMIS**' refers to a dedicated AM Computer Software program and associated systems to support effective and efficient data management that is integrated with other key property and finance management software systems of the organisation.

"**AM Strategy**" means a strategy or approach for asset management.

"**Council**" means the elected council (comprising Councillors) of the City.

"**Depreciation**" is a systematic charge that recognises the wearing out or consumption of the non- current asset over its useful life.

"Infrastructure" comprises the asset sub-classes defined in section 5 of the AMS and Guidelines issued by the Department of Local Government.

"**Level of Service**" describes the outputs or objectives of the activity the City intends to deliver to the customer. Service levels usually relate to quality, quantity, reliability, responsiveness, statutory functional requirements, environment, acceptability and cost.

"**Life Cycle**" means the phases of activities that an asset goes through, including planning, design, construction, acquisition, operation, maintenance, rehabilitation and disposal.

"**Maintenance**" means regular ongoing day-to-day work necessary to keep an asset operating to achieve its optimum life expectancy.

"**Maintenance Management Plan**" refers to documented information that specifies the lifecycle activities and processes that are required on a day to day, periodical or annual basis to ensure the safe and intended function of the assets is maintained.

"**Operations**" means the regular activities to provide public health, safety and amenity and to enable the assets to function e.g. road sweeping, grass mowing, and cleaning, street lighting and graffiti removal.

"**Renewal**" means works to upgrade an asset, refurbish an asset or the replacement of part(s) of an asset to ensure continuing equivalent capacity or performance capability.

"**Replacement**" means the complete replacement of an asset that has reached the end of its life, to provide a similar or agreed alternative, level of service.

"**Replacement Cost**" means the cost of replacing an existing asset with an identical new asset.

"**Risk**" means probability and consequence of an event that could impact on the Council's ability to meet its corporate objectives.

"**Strategic Community Plan**" is documented information that specifies how organisational objectives in the SCP are to be converted into AM objectives, the approach for developing AMPs, and the role of the AMS in supporting the achievement of the AM objectives.

"**Stakeholders**" are those people/sectors of the community that have an interest or reliance upon an asset and who may be affected by changes in the level of service of an asset.

"**Upgrade**" means enhancing an existing asset to provide higher level of service.

"**Whole of Life Cost**" refers to the total cost of an asset throughout its life cycle.

Abbreviations

ACP – Asset Class Plan
AM – Asset Management
AMP – Asset Management Plan
AM Policy – Asset Management Policy
AM Strategy – Asset Management Strategy
AM Framework – Asset Management Framework
AMS – Asset Management System
AMIS – Asset Management Information System
AMSG – Asset Management Steering Group
DLGSCI – Department of Local Government, Sport and Cultural Industries
GIS – Geographical Information System
IIMM – International Infrastructure Management Manual
IPR – Integrated Planning Framework
IPWEA – Institute of Public Works Engineering Australia
LTFP – Long Term Financial Plan
MMS – Maintenance Management Plan
WALGA – West Australian Local Government Association

APPENDIX A: CITY'S ASPIRATIONS

ASPIRATION 1: Society - Healthy, safe, vibrant and connected communities		
Objective	***Strategies***	***How Objectives are addressed in AM Plan***
1.1 - Healthy and Active people	1.1.1 Create opportunities that encourage people to be active and healthy	Undertake prompt repairs and maintenance of damaged stormwater drainage assets and optimise serviceability and usability of the network. Implement a stormwater drainage "Flooding" risk register to identify possible future problem areas. Undertake regular drainage inspections of high pedestrian trafficked areas like the Wanneroo Town centre, near schools, shopping centres and near neighbourhood centres.

ASPIRATION 4: Civic Leadership - Working with others to ensure the best use of our resources.		
Objective	***Strategies***	***How Objectives are addressed in AM Plan***
4.2 – Good Governance	4.2.1 Provide transparent and accountable governance and leadership 4.2.2 Provide responsible resource and planning management which recognises our significant future growth 4.2.3 Ensure return on investment and well maintained assets through development and implementation of a strategic asset management framework	Develop and apply asset management principles to support the management and maintenance of infrastructure assets. Maintain an accurate asset database and the provision of asset performance data to enable informed decisions making. Implement a program for condition monitoring and inspection activities to assess asset performance. Continuous review and improvement of the quality of AM practices and updating this AM Plan. Incorporate opportunity for regular stakeholder feedback through targeted KPI's Providing a defined level of service, monitoring performance and implementing initiatives to improve efficiency and effectiveness. Ongoing stakeholder consultation to establish and confirm service standards. Analyse and identify long term asset renewal demand in support of long term financial planning. Ensure services are delivered at the right price and quality. Seek and maximise alternative funding opportunities, such as grants, for the provision, maintenance and operating of transport infrastructure assets.

APPENDIX B: LIFECYCLE COST PARAMETERS

Stormwater Condition Summary				
Asset Type	**Economic Life (Years)**	**Intervention Condition (1 – 10)**	**Deterioration Behaviour Factor**	**Asset Useful Life (Years)**
Drainage Pipes	100	8	1.8	94
Drainage Pits	100	8	1.8	94
Gross Pollutant Traps	100	8	1.2	85
Underground Cells	50	8	1.2	42

Asset Component	Unit	Unit Rate ($)		Asset Component	Unit	Unit Rate ($)
Pipes – Concrete – 300mm	m	189		Pipes – HDPE – 300mm	Each	176
Pipes – Concrete – 375mm	m	210		Pipes – HDPE – 375mm	Each	275
Pipes – Concrete – 450mm	m	244		Pipes – HDPE – 450mm	Each	440
Pipes – Concrete – 525mm	m	277		Pipes – HDPE – 600mm	Each	693
Pipes – Concrete – 600mm	m	306		Pipes – HDPE – 750mm	Each	979
Pipes – Concrete – 750mm	m	408		Pipes – HDPE – 900mm	Each	1507
Pipes – Concrete – 900mm	m	596		Pipes – HDPE – 1050mm	Each	2172
Pipes – Concrete – 1050mm	m	813		Pipes – HDPE – 1200mm	Each	2772
Pipes – Concrete – 1200mm	m	1088		Pipes – HDPE – 1500mm	Each	5588
Pipes – Concrete – 1500mm	m	1500				
Pipes – Concrete – 1800mm	m	2000				

Asset Component	Unit	Unit Rate ($)
Pits – Bubble up	Each	2200
Pits - Junction	Each	2000
Pits - Gully	Each	2581

Pits – Side Entry	Each	2475
Pits - Soak	Each	2200
Pits - Outfall	Each	4300
Pits – Gross Pollutant Trap	Each	63000
Pits – Underground Cells (Ichamber)	Each	617
Sump Fencing	m	158

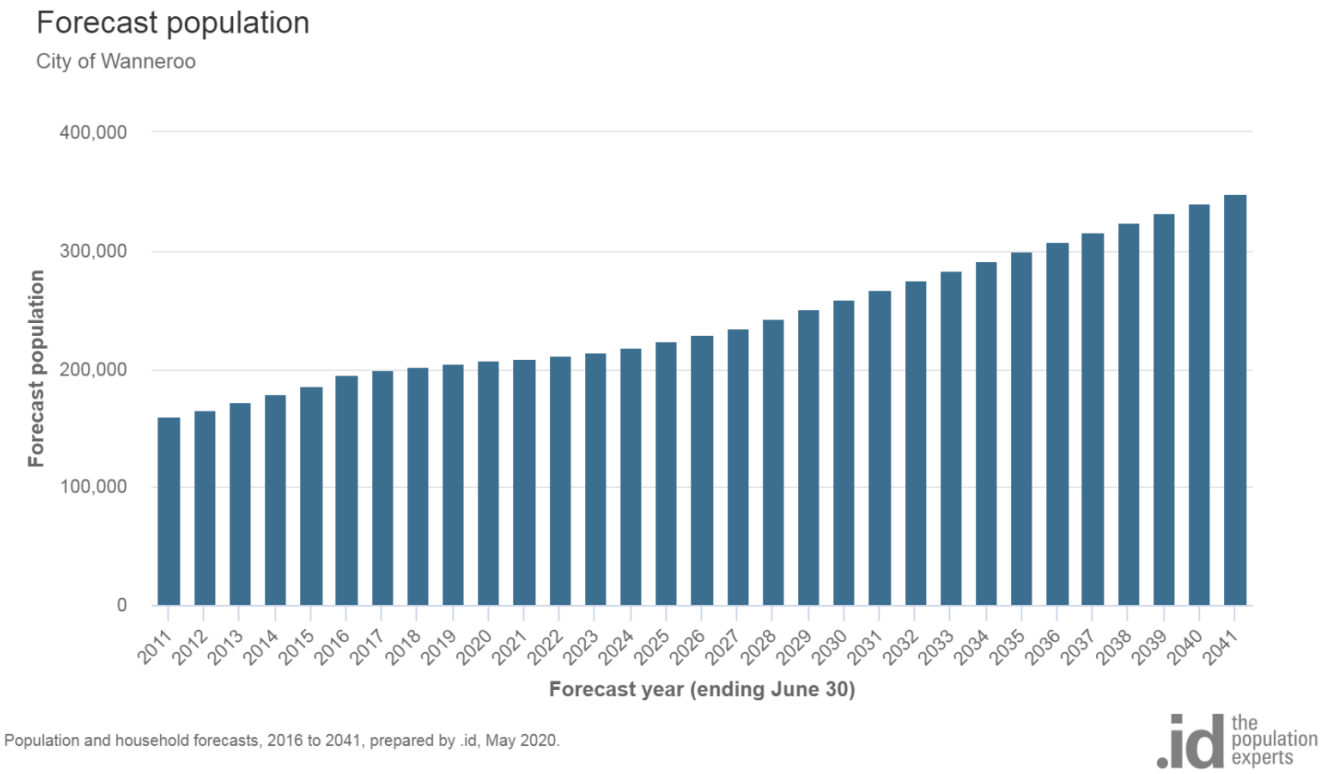
APPENDIX C: GENERIC DESCRIPTION OF ASSET CONDITION RATINGS

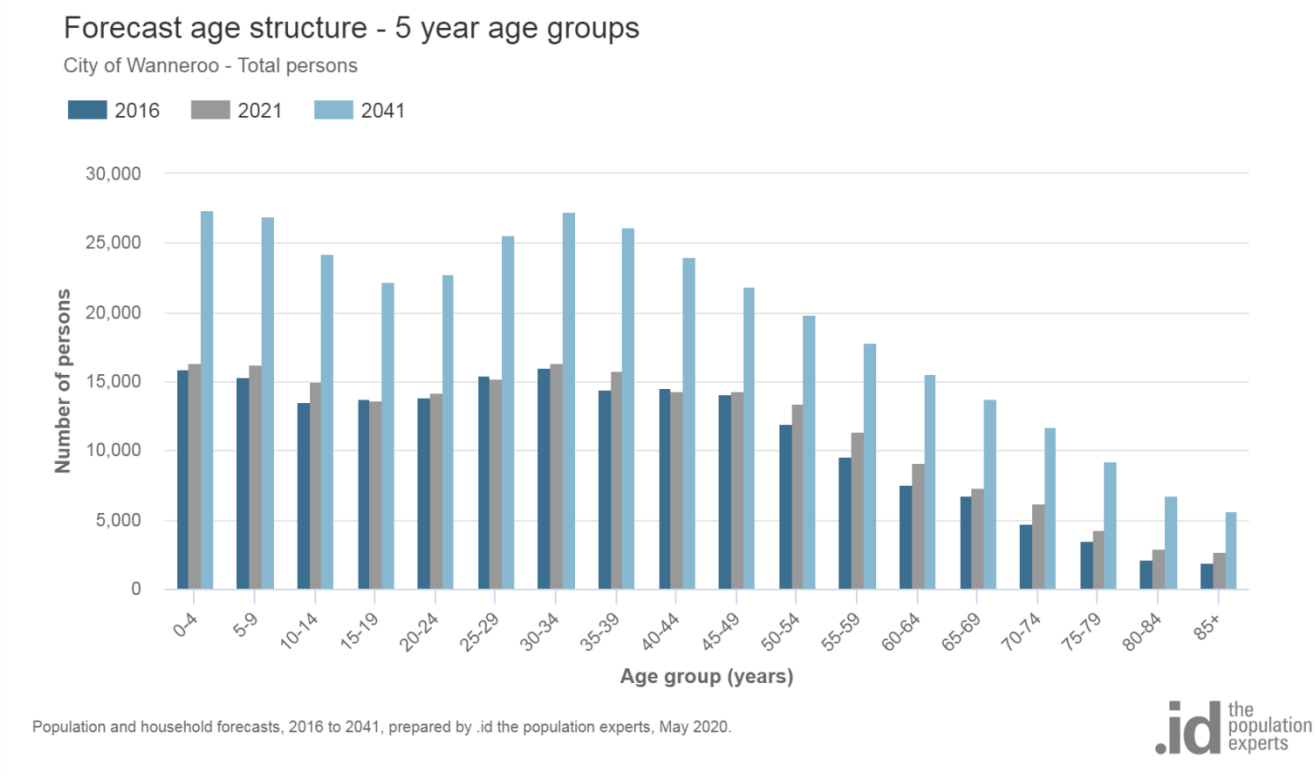
Condition Rating	Generic Description of asset condition
0	A new asset or an asset recently rehabilitated back to new condition.
1	A near new asset with no visible signs of deterioration often moved to condition 1 based upon the time since construction rather than observed condition decline.
2	An asset in excellent overall condition. There would be only very slight condition decline but it would be obvious that the asset was no longer in new condition.
3	An asset in very good overall condition but with some early stages of deterioration evident, but the deterioration still minor in nature and causing no serviceability problems.
4	An asset in good overall condition but with some obvious deterioration evident, serviceability would be impaired very slightly.
5	An asset in fair overall condition deterioration in condition would be obvious and there would be some serviceability loss.
6	An asset in Fair to poor overall condition. The condition deterioration would be quite obvious. Asset serviceability would now be affected and maintenance cost would be rising.
7	An asset in poor overall condition deterioration would be quite severe and would be starting to limit the serviceability of the asset. Maintenance cost would be high
8	An asset in very poor overall condition with serviceability now being heavily impacted upon by the poor condition. Maintenance cost would be very high and the asset would at a point where it needed to be rehabilitated.
9	An asset in extremely poor condition with severe serviceability problems and needing rehabilitation immediately. Could also be a risk to remain in service
10	An asset that has failed which is no longer serviceable and should not remain in service. There would be an extreme risk in leaving the asset in service.

APPENDIX D: POPULATION FORECASTS/DEMOGRAPHIC

The City's demographic information and analysis is provided by .id are based on results from the 2020, 2016, 2011, 2006, 2001, 1996 and 1991 Australian Bureau of Statistics Censuses of Population and Housing *(https://forecast.id.com.au/wanneroo).*

Population forecast to 2041




Forecast age structure - 5 year age groups
City of Wanneroo - Total persons
2016
2021
2041
30,000
25,000
20,000
15,000
10,000
5,000
0
Number of persons
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-79
80-84
85+
Age group (years)
Population and household forecasts, 2016 to 2041, prepared by .id the population experts, May 2020.
.id the population experts

APPENDIX E: STORMWATER DRAINAGE ASSETS – CAPITAL SUBPROGRAMS

(Figures reported in '000)

E.1: Stormwater Drainage - Capital Works Program

Project No	Asset Location	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	2035/36	2036/37	2037/38	2038/39
PR-2833	Wangara Industrial Area	10																			
PR-2973	Yellagonga Regional Park	10																			
PR-4217	63 Girrawheen Avenue			23																	
PR-SW08	South Yanchep Foreshore				25	150															
PR-SW09	North Mindarie Foreshore					25	150														
PR-SW07	Urban Catchments (to be determined)							350	350	350	350	350	350	350	350	350	350	350	350	350	350

APPENDIX F: LEVEL OF SERVICE PERFORMANCE
Community Levels of Service

Key Performance Measure	Level of Service	Performance Measure Process	Performance Target	Current Performance
COMMUNITY LEVELS OF SERVICE				
Quality/ Condition	Performance in providing and maintaining stormwater drainage facilities.	Customer complaints associated with drainage blockages	< 5 pa	Not currently measured
Response times	Response time to customer requests.	Customer request responded to in accordance with Customer Service Charter	100% responded to in accordance with Charter	Not currently measured
Safety	Provide a stormwater drainage system that is low risk to the community.	No. of insurance claims due to flooding associated with stormwater drainage runoff	0 claims per year	Not currently measured

Technical Levels of Service

Key Performance Measure	Level of Service	Performance Measure Process	Performance Target	Current Performance
TECHNICAL LEVELS OF SERVICE				
Quality/ Condition	Assets renewed before the end of their useful life.	No maintenance issues due to age and condition	No replaceable drainage with asset conditions greater than 8.	Meeting target.
Function & Quantity	Provision of stormwater collection pits to adequately remove stormwater from the road surface.	Provision of adequate stormwater drainage collection pits in accordance with minimum development guidelines.	All collection pits meet development guidelines	Meeting target.
Cost effectiveness	Undertake preventative maintenance to reduce more expensive reactive maintenance	Percentage of maintenance classed as preventative	>70% preventative against reactive as measured using the AMIS	Not currently measured
Safety	The safe and efficient removal of stormwater insuring roads are clean and safe.	Routine safety inspection undertaken annually by maintenance staff.	90% of safety inspections are completed once per annum	Not currently measured
	Response times to defects not exceeding thresholds defined in the Engineering Maintenance Intervention Levels[2]	Time to respond to routine safety inspection undertaken annually by maintenance staff.	Defects are investigated and responded to within allocated timeframes in 90% of cases	Not currently measured

Note:
 # The data required to monitor and report on the City's specific performance in some areas is not currently available. Improved collection of this data has been listed as a required improvement outcome for this plan.

1. This score is the sum of (Excellent + Good + okay) from Figure 12 in Section 4.1.

2. Refer HPE # 19/234182 for details.

APPENDIX G: STORMWATER DRAINAGE ASSET RISKS AND TREATMENT PLANS

Asset at Risk	Risk	Consequence	Likelihood	Risk Rating	Risk Treatment Plan	ECA
All assets	Inaccurate information in the asset register (attributes, conditions, etc.) may cause financial shock to the organisation	Minor	Rare	Low	Review recent records and update asset register with works undertaken. Change any information found to be inaccurate. Put systems into place so that renewal data is entered into the system appropriately.	Satisfactory
	Flooding of roads and reserves causing hazards to vehicles and pedestrians.	Minor	Unlikely	Low	Regular programmed inspection and maintenance of the City's drainage system.	Satisfactory
	Flooding of private property causing personal risk to life and damage. Also financial risk to the City.	Minor	Rare	Low	Regular programmed inspection and maintenance of the City's drainage system.	Satisfactory
	Damage to the City's stormwater network from natural disaster	Moderate	Rare	Low	Insurance of the City's assets	Satisfactory
	Drowning within the City's stormwater network	Moderate	Rare	Low	Regular programmed inspection and maintenance of the City's drainage system.	Satisfactory